PROGRAM FOR ARTERIAL SYSTEM SYNCHRONIZATION (PASS)

Program Guidelines
2010/2011 Cycle of Projects

February, 2010

METROPOLITAN
TRANSPORTATION
COMMISSION

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1 Introduction

The purpose of the Program for Arterial System Synchronization (PASS) is to provide technical and financial assistance to Bay Area agencies to help improve the safe and efficient operation of certain traffic signal systems and corridors. The Transportation 2035 Plan provides approximately $1.25 million per year in CMAQ funds for traffic signal coordination under PASS. MTC will administer and manage this program, but the primary responsibility for the operation and retiming of traffic signals resides with the agency that owns them. Projects are defined by local agencies, evaluated by MTC staff, and assigned to consultants retained by MTC.

Under this regional program, technical assistance and financial support will be focused on traffic signal system projects that:

i) Interact with freeways and state highways;
ii) Involve traffic signals from multiple jurisdictions;
iii) Operate on corridors with established regional significance;
iv) Provide priority for transit vehicles; and
v) Have been developed in conjunction with other regional programs.

1.1 Goals and Objectives

The goals and objectives of the PASS are as follows:

1. Coordinate local and state-owned signal systems, and retime signal systems in response to changes to the state-owned system. This would include changes resulting from freeway widening, reconfiguration of interchanges or intersections, implementation of ramp metering, or altering the lane configuration on state highways.
2. Establish and maintain communications between systems owned by Caltrans and local agencies. This could entail provision of GPS units, signal interconnect cable, or other technology to enable two-way communication and coordination, as well as retiming the signals once the new communications system is activated.
3. Retime traffic signal systems to support priority for transit vehicles. This would include active priority through signal preemption systems and passive priority through signal timing plans, and could include providing transit vehicles with rapid access/egress from major transit hubs.
4. Retime traffic signal systems in conjunction with other established regional programs, such as safe routes to schools, safe routes to transit, smart corridors, and incident management.

Typical tasks performed under the PASS to meet program goals and objectives including, but not limited to, the following:

1. Improve reliability and predictability of travel along arterial roads.
   - Develop and implement signal coordination plans (a.m., p.m., and/or midday) that reduce travel time and delay on corridors that contain state and local signals.
   - Collect weekday peak period turning movement counts at all study intersections, including pedestrian and bicycle counts, and seven-day 24-hour machine counts at strategic locations to determine periods of coordination.

- Develop and implement signal coordination plans based on the throughput of people rather than vehicles.
- Develop and implement flush plans for arterials that are used as diversion routes in the event of freeway incidents, in conjunction with other incident management actions.
- Develop and implement optimized actuated settings for fully actuated signals to minimize queuing during non-peak periods.

2. Improve air quality through decreased motor vehicle emissions and fuel consumption.
   - Develop and implement signal coordination plans that reduce starts and stops and promote uniform travel speeds.
   - Develop and implement transit signal priority plans to make transit a more attractive travel option.
3. Improve the safety of motorists, pedestrians, and bicyclists.
   - Collect pedestrian and bicyclist volume data at the same time as vehicle count data at intersections to be coordinated.
   - Develop and implement signal coordination plans that promote uniform travel speeds, thereby reducing rear-end collisions.
   - Review existing pedestrian crossing times and bicycle detection at intersections to be coordinated, and recommend adjustments as necessary.
   - Review collision history for patterns that are susceptible to correction through signal timing and recommend adjustments as necessary.
4. Provide streamlined program administration and project management.
   - Provide high-quality technical assistance in a cost-effective manner.
   - Require local agency review and approval of timing plans prior to implementation.
   - Provide a peer review option to small agencies that do not have in-house traffic engineering staff.
   - Use data on the quality of the deliverables and the number of projects completed within schedule and budget to guide assignment of projects to consultants in subsequent cycles.
   - Facilitate interagency communication and coordination.

2 Eligibility

2.1 Applicant Eligibility

The applicant for PASS funds must be a Bay Area public agency, and must either be an owner of the traffic signal system addressed in the application, or authorized to act on behalf of multiple agencies (e.g., a smart corridor) that own the traffic signal system addressed in the application. For an applicant to apply on behalf of other agencies, the applicant must have the other agencies sign the application or submit letters of support for the proposed project that authorize the applicant to apply on their behalf. Applicants for projects that involve Caltrans traffic signals do not need to submit letters of support or signatures from Caltrans since these applications will be reviewed by MTC and Caltrans after submission. Project sponsors are required, however, to notify the appropriate Caltrans Traffic Operations staff about their PASS application if it includes Caltrans signals. If any additional information is needed from Caltrans to complete the application, the project sponsor must coordinate with Caltrans at least two weeks in advance of the application submittal deadline. All agencies that are involved in a project must also: 1) be willing to indemnify MTC by signing an indemnification agreement before any work on the project begins; 2) provide staff time to review and approve project deliverables as per the

schedule; 3) provide staff time to assist consultants with implementing timing plans; and 4) commit to completing the project within one year of the award date.

2.1.1 Eligible Projects

To be eligible for PASS funds, a project must entail retiming traffic signal systems, consistent with the purposes set forth in Section 1 of the program guidelines. As part of the application, the project sponsor must demonstrate how the proposed project meets the goals and objectives described in Section 1. There is no maximum funding for a project. While there is no maximum number of projects that may be submitted for consideration, it is unlikely that more than two projects will be awarded to the same project sponsor in a year.

Traffic signal retiming projects must involve a minimum of eight signalized intersections with interconnection or reliable time sources, and are currently capable of coordinated operation, unless the project application includes provision of interconnection or a reliable time source.

Improvements to communication systems are eligible, but limited to a maximum of $10,000 per project. Projects that link signals owned by Caltrans and local agencies will be given priority for PASS funding. If a local agency provides GPS units through PASS to maintain time-based coordination with a Caltrans signal or system, Caltrans will require provision of a minimum of one spare GPS for every four units installed. Capital improvements funded with PASS federal funds will be limited to communication systems, and will be capped at $10,000 per project. MTC, at its sole discretion, may approve more funds for this task for the successful completion of any particular project.

As mentioned in Section 1, high priority will be given to those projects that interact with freeways and state highways and involve traffic signals from multiple jurisdictions.

Projects that involve traffic signals owned by one local agency are considered to have low priority for PASS funding, unless they are part of a regional program, such as safe routes to school/transit, smart corridors, or incident management.

2.1.2 Ineligible Projects

Projects that involve traffic signals that have been coordinated within the past three years are ineligible, unless a change to the state-owned portion of the system, as described on page 1 of these Guidelines has occurred.

Projects that involve development of traffic signal coordination plans for future traffic volumes are also ineligible.

2.2 Eligible Work Types

The following types of projects are eligible for funding under PASS:

- Coordination with state-owned signals
- Transit Priority
- Projects developed in conjunction with other regional programs, such as Safe Routes to School/Transit, smart corridors, or incident management.

For projects that entail signal coordination, the following tasks are eligible:

1. Signal coordination for weekday morning, afternoon and/or midday peak periods;
2. Transit priority for weekday morning, afternoon and/or midday peak periods;
3. Signal coordination for additional scenarios, such as incident management flush plans/diversion routes, or timing plans developed in conjunction with Safe Routes to School/Transit, for the same signals addressed in (1) or (2) above and MTC concurs with the need for these additional timing plans.

3 Application Process

3.1 Call for Projects

The Call for Projects occurs once per year using a standardized application form. Applicants are given approximately one (1) month for preparation of the application. All applications for eligible projects received by the deadline shown in the application form will be evaluated by MTC staff. Complete applications that clearly demonstrate how the proposed project meets the goals and objectives described in Section 1 will be given high priority for PASS funding. Projects that do not receive funding immediately will be placed on eligibility list, in case one or more selected projects can not be implemented.

3.2 Application

The Call for Projects sets the detailed requirements and deadlines for submitting the project applications. The sponsoring agency has to submit five hard copies of the completed application including all supporting materials and a PDF copy (in a CD Rom) to the MTC Project Manager. Faxed or Emailed applications will not be accepted or considered. When the Call for Projects is issued, the electronic version of the project application will be available for download from the MTC website at: http://www.mtc.ca.gov/jobs/contracts/ or applicants may contact the MTC Project Manager directly.

MTC does not require applicants to furnish proof of permission to apply or to provide the local match. It is the responsibility of each applicant to ensure all local funding and approval requirements are met.

3.3 Waiver of Claims and Indemnification

Receipt of a PASS grant is contingent on the local agency's willingness to enter into an agreement with MTC to: (1) waive any and all claims against MTC for any loss liability or damages resulting from this program (directly or indirectly); and (2) indemnify, hold harmless, and defend MTC against any and all third party claims that may result from the agency's participation in the program. This agreement has to be executed by the person authorized to enter into agreements with MTC. An agency that requires peer review assistance will also be required to sign such an agreement in favor of the peer reviewer. When the Call for Projects is issued, the electronic version of this agreement will be available for download along with the project application from the MTC website at: http://www.mtc.ca.gov/jobs/contracts/ or applicants may contact the MTC Project Manager directly.

All agencies (sponsor and participants) are encouraged to review this agreement with their attorneys to obtain preliminary approval before submitting an application. It is recommended that the local agency start the indemnification agreement approval process as soon the application is filed in the spring, thus providing themselves with sufficient time to submit a signed agreement by the project commencement in the summer. The waiver and indemnification agreement is not required to be included with the application but will be required within thirty (30) days of notification that the agency has been selected for participation in the program. Please note that the MTC Project Manager is required to have this completed form on file **before** any work on the project can begin.

See Section 5.5 of the Program Guidelines for information regarding consultant liability.

4 Selection Process

4.1 Administrative Responsibility

MTC will administer and manage this program. Projects are defined by local agencies, evaluated by MTC staff, and assigned to consultants retained by MTC. Projects will be evaluated based upon how well the application demonstrates how the proposed project meets the goals and objectives described in Section 1. MTC will obligate federal funds through Caltrans; serve as the recipient of the federal funds; contract with consultants; approve consultant deliverables; and pay consultant invoices. Consultants are paid directly by MTC using a deliverable-based schedule.

4.2 Project Selection and Grant Award

The eligible projects are evaluated by MTC and Caltrans, to determine projects with high-priority for funding under PASS. Successful project applicants will be informed after the approval by the MTC Operations Committee. Grants are awarded in the form of Consultant assistance, and MTC directly pays the Consultant at the successful completion of each project deliverable as mentioned in Table 5.4.3. To maximize the use of available funds for signal coordination, agency staff costs are not typically reimbursed in part or full under PASS. However, MTC understands some projects with a large number of signals require a significant amount of local agency staff time, and thus the funding of this task is solely at the discretion of MTC based on the availability of funds.

4.3 Consultant Assignment

It is MTC's intention to assign projects to consultants during the first cycle based on equity and sponsor preference. Sponsors will be given an opportunity to indicate their consultant preferences. Project assignment in the second year of the contract will reflect the consultant's performance during the prior year and the project sponsor preferences.

4.4 Project Delivery

The assigned consultant contacts the project sponsor, other involved agencies, and MTC to schedule the kick-off meeting for the project. The kick-off meeting provides an opportunity to

establish communication channels and protocols; discuss the scope of work, schedule, and budget; gather available information; and discuss the sponsor's goals with the consultant.

All necessary technical correspondence occurs between the project sponsor, other involved agencies, and the consultant. MTC is copied on all technical correspondence. The role of MTC is to ensure that high quality, timely, and within-budget technical assistance is provided for the agreed upon scope of work. Any changes to the scope of work agreed upon at the kick-off meeting are subject to MTC approval.

All agencies that own or operate traffic signals within the project limits, as well as MTC, are required to review consultant deliverables in a timely fashion. MTC's review of deliverables focuses on adherence to the approved scope of work. Consultants are paid for each deliverable by MTC after both the project sponsor and MTC have approved the deliverable and all comments have been addressed.

Deliverable review time is set during the kick-off meeting. The consultant has to allocate sufficient time for all the agencies involved to review and comment on the deliverable. At the completion of each deliverable the consultant has to submit a 'Comment Response Sheet' incorporating the comments received from the agencies and the actions taken to address the comments. Any changes to the agreed upon schedule are subject to MTC approval.

4.5 Consultant Evaluation

At the conclusion of each project, project sponsors are required to fill out and return to MTC a confidential consultant evaluation form. MTC uses the results of the evaluation to determine the number of projects that are assigned to the consultant in the following year of the consultant contract and as a reference for future evaluations.

4.6 Schedule

Task	Timeline for 2010/2011 Cycle
0. Call for Projects and Consultant RFQ	Spring 2010
1. Project Start-Up	
Kick-Off Meetings	July 2010
Detailed Workscope, Schedule, and Budget	August 2010
2. Analysis of Existing Conditions	
Data Collection	September 2010
Analysis	October 2010
3. Recommendations	January 2011
4. Implementation and Evaluation	Implementation by March 2011; Final Report by June 2011.

5 Consultants

5.1 Consultant Selection

A Request for Qualifications (RFQ) will be released to select consultants for this program. A panel consisting of staff from MTC and Caltrans will evaluate the Statement of Qualifications (SOQ) and conduct interviews, if necessary. The length of the consultant contracts would be for one cycle of the program with the option to renew for 2 more cycles at the sole discretion of MTC. This will help evaluate consultant's performance in the first cycle of the program and make necessary changes accordingly. MTC retains two to four consultants selected after the RFQ process to provide technical assistance for projects under the program.

5.2 Qualifications

All PASS consultants have the following qualifications:

1. Lead staff with applied knowledge of, and expertise in:
   a. the principles of traffic signal timing and signal coordination;
   b. hardware and software used for traffic signal systems;
   c. analysis of recent collision history for susceptibility to correction through traffic signal timing and coordination; and,
   d. accommodating the needs of all users of arterials, including motorists, pedestrians, bicyclists, transit patrons, and transit vehicles in the context of traffic signal timing and coordination.
2. Lead and technical staff with experience in:
   a. the use of micro-simulation software for optimization of arterial signal coordination;
   b. implementation of timing plans using legacy and modern traffic signal system software and hardware; and,
   c. operation and programming of different types of controllers.
3. Lead staff with eight (8) or more years of experience in the areas of expertise noted above and California Civil or Traffic Engineer registration; and technical staff with three (3) or more years of experience in the areas of expertise noted above.

5.3 Standard Scope of Work

The services to be performed by Consultant will consist of services requested by the MTC Project Manager or a designated representative including, but not limited to, the following:

0. Program Kick-Off

At the beginning of each annual cycle, Consultant will meet with the MTC Project Manager and other PASS consultants to discuss Program guidelines and standardization of services, deliverable formats, and project administration. Electronic files shall be named in accordance with a naming convention specified by the MTC Project Manager.

1. Project Start-Up

1.1 Project Kick-Off Meeting – Consultant will schedule a meeting with the project sponsor, other involved agencies, and the MTC Project Manager or designated representative to kick-off the project; establish communication channels and protocols; discuss the scope of work, schedule, and budget; gather available information; and obtain a thorough understanding of the goals of the project. Specific topics to discuss include the turning movement data collection and times to collect travel time data.

1.2 Preparation of a Detailed Workscope, Schedule, and Budget – Consultant will prepare a Detailed Workscope, Schedule, and Budget (DWSB) for review and approval by the project sponsor, other involved agencies, and the MTC Project Manager. Consultant will finalize the DWSB based on comments received from the project sponsor, other involved agencies, and the MTC Project Manager. This deliverable is invoiced after the approval of the Final DWSB.

Deliverable 1A:	Draft Detailed Workscope, Schedule, and Budget
Deliverable 1B:	Final Detailed Workscope, Schedule, and Budget

2. Analysis of Existing Conditions

Consultant will collect and analyze all information necessary to thoroughly understand existing traffic conditions in the study area and be able to develop optimal time-of-day traffic signal coordination plans and transit signal priority plans, if applicable.

2.1 Data Collection – Consultant will collect existing conditions data including, but not limited to, the following:

2.1.1. From the project sponsor and other involved agencies, Consultant will collect existing timing sheets, existing coordination plans, traffic signal as-built drawings, aerial photos, maps, and collision diagrams for the study intersections, if available.

2.1.2. From the project sponsor and other involved agencies, including transit properties, if any, Consultant will collect signal timing and signal priority preferences, including, but not limited to, those related to pedestrian and bicycle timing, leading and lagging left-turn phasing, and conditional service, as well as the timing optimization software preference.

2.1.3. Consultant will conduct weekday peak period turning movement counts at all study intersections, including pedestrian and bicycle counts, and seven-day 24-hour machine counts at strategic locations to determine periods of coordination. All counts shall be taken during times and days that are representative of the times and days for which coordination plans will be developed. It is preferred that all counts be summarized in MS Excel format.

2.1.4. Consultant will conduct a field review of all study intersections and street segments to verify lane geometry, speed limits, storage lengths, signal phasing, distances between intersections, and crosswalk lengths, unless the information is available through other

sources such as aerial photos and speed surveys. Consultant will conduct a field review at key intersections to measure queue lengths and saturation flows for heavy movements.

2.1.5. Consultant will conduct a field review to observe typical traffic patterns during the weekday peak periods for which coordination plans will be developed. Consultant will note factors that are expected to affect signal progression including, but not limited to: intersections with high pedestrian or bicyclist volumes; over-saturated intersections; uneven lane distribution; high volumes of trucks and buses; high-volume unsignalized intersections, including interchanges; parking maneuvers; and presence and location of bus stops.

2.1.6. Consultant will verify signal coordination and transit priority capabilities of existing equipment and communications infrastructure. Consultant will take digital photos of the controller cabinet and the contents of the controller cabinet, unless waived by the system owner. The digital photos may be taken during timing plan implementation, at the discretion of the Consultant.

2.1.7. Consultant will conduct travel time and delay studies, including number of stops, during times and days that are representative of the times and days for which coordination plans will be developed. A minimum of four runs shall be conducted for each direction for each peak period. Travel time and delay studies shall be conducted using the floating car method. The time of performance of the travel time and delay studies will be defined at the kick-off meeting.

2.2 Analysis of Existing Conditions – Consultant will analyze the data obtained from Task 2.1 as follows:

2.2.1 As permitted by the project stakeholders, Consultant will review initial and actuated settings for each study intersection to identify opportunities to minimize delay during non-coordination periods and enhance pedestrian and bicyclist safety. The analysis shall include, but not be limited to, review of minimum and maximum green settings; yellow and red times; pedestrian timing; and gap, extension, and reduction settings.

2.2.2 Consultant will review collision diagrams for the study intersections, if available, to identify patterns that are susceptible to correction through signal timing.

2.2.3 Using software specified by the project sponsor, Consultant will develop a model of the study area and calibrate the model based on field observations of existing conditions. Signal coordination optimization software may include, but not be limited to, Synchro, TRANSYT 7-F, or PASSER. Transit signal priority modeling software may include, but not be limited to, VISSIM or Paramics. Consultant will calibrate the model based on travel time and delay studies and field observations of queue lengths and saturation flows for heavy movements at key intersections.

2.2.4 Consultant will summarize the results of the existing conditions analyses in an Existing Conditions Technical Memorandum. At a minimum, the Memo will include: description of the roadway network and surrounding land uses, including a

map showing the study intersections; description of traffic volumes, including day-to-day variability and directionality; description of traffic signal controllers and communication capabilities; identification of factors that are expected to affect progression; results of analysis of initial and actuated settings; description of collision patterns that may be susceptible to correction through signal timing; measures of effectiveness, including delay, number of stops, and travel time from the travel time and delay studies, and fuel consumption and emissions using a methodology specified by MTC; and model calibration results, including a summary of changes to the optimization software's default values. Consultant may be required to meet with the project sponsor and other involved agencies to present and discuss the results of the Memo. Consultant will finalize the Memo based on comments received from the project sponsor, other involved agencies, and the MTC Project Manager.

Deliverable 2A:	Draft Existing Conditions Technical Memorandum, including computer model with existing timings
Deliverable 2B:	Final Existing Conditions Technical Memorandum, including computer model with existing timings

3. Development of Recommendations

Consultant will develop recommendations of optimal initial and actuated settings; time-of-day coordination plans and hours of coordinated operation; and transit signal priority plans and hours of operation, if applicable. Development of optimal time-of-day coordination plans shall include analyses of signal grouping; phasing and phase sequence, including conditional service*;* cycle lengths, splits, and offsets. Consultant will summarize recommendations in a Recommendations Technical Memorandum. The Memo shall also include a comparison of existing and proposed timings and a description of expected improvements. Consultant will finalize the Memo based on comments received from the project sponsor, other involved agencies, and the MTC Project Manager.

Deliverable 3A:	Draft Recommendations Technical Memorandum, including computer model with recommended timings
Deliverable 3B:	Final Recommendations Technical Memorandum, including computer model with recommended timings

4. Implementation and Evaluation

Consultant will implement and evaluate the approved improvements as follows:

4.1 Consultant will prepare for review and approval by the project sponsor and other involved agencies appropriate timing sheets based on the approved timing plans. Consultant will revise the timing sheets based on comments received from the project sponsor and other involved agencies.

4.2 Consultant will implement, or assist agency staff in the implementation of, the new settings and timings. Implementation may have to be done in the field or from a central location, depending upon communication capabilities and agency preferences.

4.3 Consultant will fine-tune, or assist agency staff in the fine-tuning of, the new settings and timings. Consultant will fine-tune timings in the field and record all changes. Fine-tuning shall be conducted during times and days that are representative of the times and days for which coordination plans were developed. This also requires additional field visits to verify and assess any changes made during the fine-tuning process.

4.4 Consultant will conduct travel time and delay studies, including number of stops, at the key corridors identified under Task 2.1.7. Travel time and delay studies shall be conducted during times and days that are representative of the times and days for which coordination plans were developed. A minimum of four runs shall be conducted for each direction for each peak period. Travel time and delay studies shall be conducted using the floating car method.

4.5 Consultant will provide to the MTC Project Manager electronic files of all traffic counts, and controller and cabinet information, in a file-naming convention specified by MTC.

4.6 Consultant will calculate measures of effectiveness of the improved system, including delay, number of stops, travel time, fuel consumption, emissions, benefit: cost, and cost effectiveness for emissions reductions. The methodology for calculating fuel consumption, emissions, benefit: cost, and cost effectiveness for emissions reductions will be specified by MTC.

4.7 Consultant will prepare a Final Timings and Evaluation Technical Memorandum, which will include but not be limited to: the final periods of coordination; changes between the timings recommended under Task 3 and the final timings that were implemented; the number of locations where changes were made to better accommodate pedestrians and/or bicyclists; and the results of the evaluation of measures of effectiveness.

Deliverable 4A:	Revised Timing Sheets
Deliverable 4B:	Final Timings and Evaluation Technical Memorandum, including final timing sheets with computer model, field review with local jurisdiction, and the Benefit-cost analysis worksheet

5. Additional Services

For projects involving transit signal priority, cut-through traffic studies, multiple traffic signal systems, cross-coordination, interconnecting state and local systems, etc., Consultant may be requested to perform services in addition to those described above. Such services may include, but are not limited to, additional meetings, field visits, studies, fine-tuning, procuring and installing GPS clocks, conditional diagrams, updating Visio coversheets when applicable, etc. Should additional services be requested by the MTC Project Manager, Consultant shall include a detailed description of such additional services, a staffing plan, and a man-hour estimate in its DWSB. The scope of these services, as well as the fixed price to be added to the base fee per intersection set forth in Section 5.3, will be negotiated on a case-by-case basis. Additional services may also be requested by Consultant after the DWSB has been approved by requesting an amendment to the approved DWSB. If the project requires procuring GPS clocks using the $10,000 per project communication systems improvement funding under PASS, the Consultant

shall procure these clocks and invoice MTC as an additional service. The procedures for the installation of this equipment will be discussed in detail at the project kick-off meetings.

6. Reduced Services

Consultant may be requested to perform only some of the services above in cases where some services are not part of the PASS project, are already available, or agency staff wishes to perform them themselves. Should reduced services be requested, Consultant shall identify in its DWSB which tasks will be performed by the Consultant and which will be performed by the agency. The fee for reduced services shall be a percentage of the base fee per intersection set forth in Section 5.4 that is commensurate with the proportion of services to be performed by Consultant. Deliverables will be negotiated on a case-by-case basis.

5.4 Budget and Basis of Payment

5.4.1 Budget for Basic Signal Coordination

MTC will pay consultants on a fixed fee basis, based on the following fee schedule.

Service (Tasks 0 through 4)	Amount Due*
Time-of-day signal coordination with timings implemented remotely from intersection, e.g., via dial-up or from traffic management center	$2350 per intersection for three scenarios $2100 per intersection for two scenarios
Time-of-day signal coordination with timings implemented in the field	$2550 per intersection for three scenarios $2300 per intersection for two scenarios

* Scenario = two-hour morning, off-peak/midday, or afternoon weekday peak period

5.4.2 Budget for Additional Services

MTC recognizes that some projects may require additional analyses, e.g. those involving transit signal priority, cut-through traffic studies, multiple traffic signal systems, cross-coordination, interconnecting state and local systems, etc. The budget for the additional services portion of these projects is based on the nature of the technical assistance requested by the project sponsor, and is finalized at the project kick-off meeting.

5.4.3 Basis of Payment

MTC will pay consultants by deliverable based tasks based on the following payment schedule. Payment will be authorized after both the project sponsor and the MTC Project Manager have approved the deliverable.

Task	Deliverables (#)	Payment
1.	Draft and Final Detailed Workscope, Schedule and Budget (#1A and #1B)	5% of Base Project Budget
2.	Draft Analysis of Existing Conditions Technical Memorandum (#2A)	35% of Base Project Budget
2.	Final Analysis of Existing Conditions Technical Memorandum (#2B)	10% of Base Project Budget
3.	Draft Recommendations Technical Memorandum (#3A)	15% of Base Project Budget
3.	Final Recommendations Technical Memorandum (#3B)	10% of Base Project Budget
4.	Revised Timing Sheets (#4A)	10% of Base Project Budget
4.	Final Timings and Evaluation Technical Memorandum (#4B)	15% of Base Project Budget
5.	Additional Services or Equipment Purchases	To Be Negotiated

5.5 Consultant Liability and Insurance

5.5.1 Indemnification of MTC and Client Jurisdictions

Consultants are required to indemnify MTC and all client jurisdictions. In addition to the indemnification, consultants are required to include MTC and all client jurisdictions as additional insured under their general commercial liability insurance.

5.5.2 Insurance Requirements

Consultants are required to maintain insurance coverage during the term of the contract with MTC, including professional liability insurance in the amount of $1,000,000. Each policy or policies shall include MTC and all client jurisdictions as additional insured and an endorsement providing that such insurance is primary insurance and not insurance of MTC or any client jurisdiction will be called on to contribute to a loss.

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